

REPORT
OF THE
DEPARTMENT OF THE NAVAL SERVICE
FOR THE
FISCAL YEAR ENDING MARCH 31, 1918

PRINTED BY ORDER OF PARLIAMENT



OTTAWA
J. DE LABROQUERIE TACHÉ
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1918

REPORT

OF THE

DEPARTMENT OF THE NAVAL SERVICE

FOR THE

FISCAL YEAR ENDING MARCH 31, 1918

PRESENTED BY ORDER OF THE SECRETARY



OFFICE OF THE SECRETARY OF THE NAVY
WASHINGTON, D. C.
1918

*To His Excellency the Duke of Devonshire, K.G., P.C., G.C.M.G., G.C.V.O., etc. etc.,
Governor General and Commander in Chief of the Dominion of Canada.*

MAY IT PLEASE YOUR EXCELLENCY:

I have the honour to submit herewith for the information of Your Excellency and the Parliament of Canada, the Eighth Annual Report of the Department of the Naval Service, being for the year ended March 31, 1918, except the Fisheries Branch, reported in a separate publication.

I have the honour to be,

Your Excellency's most obedient servant,

C. C. BALLANTYNE,

Minister of the Naval Service.

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REPORT

OF THE

DEPARTMENT OF THE NAVAL SERVICE.

For the Fiscal Year Ending March 31, 1918.

OTTAWA, August 28, 1918.

Hon. C. C. BALLANTYNE,
Minister of the Naval Service,
Ottawa, Ont.

SIR,—I have the honour to report on the Department of the Naval Service for the year ending March 31, 1918, under the following headings:—

1. Naval Service.
2. Survey of Tides and Currents.
3. Hydrographic Survey.
4. Stores.
5. Canadian Arctic Expedition.
6. Radiotelegraphs.
7. Fisheries Protection Service.
8. Life Saving Service.
9. Expenditures.

1. NAVAL SERVICE.

Royal Naval College.—The progress both mental and physical of the cadets at the Royal Naval College of Canada continues to be most satisfactory. An examination for the entry of cadets was held by the Civil Service Commission in May, 1917, at which thirty applicants sat. Twenty of these were successful, and were entered in the Naval College in August, 1917. Three senior cadets were promoted to midshipmen and sent on board ship to complete their training.

As a result of the explosion at Halifax, many of the cadets and professors were seriously injured and the college building was so badly wrecked that it was rendered uninhabitable. The reports on the behaviour of both cadets and officers of the college during the catastrophe are very gratifying. All who were able to do so, rendered very possible assistance to those seriously injured. Two cadets have been unable to rejoin the college owing to injuries sustained.

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The Naval College was transferred to Kingston to complete the year; through the courtesy of the Militia authorities accommodation was provided at the Royal Military College.

The department has made arrangements to temporarily transfer the Naval College from Halifax to Esquimalt. Studies will be resumed by the cadets at the latter place early in the fall of 1918.

Naval Dockyards.—Halifax dockyard has carried out repairs necessary for vessels of the North America and West Indies station, the Canadian Coast patrol vessels, and also government ships of other departments. Owing to the explosion in December, 1917, operations at this dockyard were greatly deranged, but temporary arrangements have been made to carry on the work pending its re-establishment.

Esquimalt dockyard has carried out repairs necessary to the vessels of the Imperial Navy patrolling the Pacific and to ships of the Canadian Navy on the west coast. Repairs to vessels of other government departments were also effected. Both dockyards performed any work required by ships of Allied Governments calling at Halifax and Esquimalt.

Personnel.—The requisite number of personnel for the manning of all H.M.C. ships has been maintained by the entry of men with previous sea experience and by the employment of R.N.C.V.R. officers and men. The department has carried out its recruiting in such a manner as would least interfere with the enforcement of the Military Service Act. All men of military age applying for entry in the Canadian Naval Service have been obliged to obtain their discharge from the Canadian Expeditionary Forces prior to enrolment.

Recruiting has also been carried out for the entry of men in the Royal Naval Air Service, and medical students for duty as surgeon probationers in the Imperial Navy. Recruiting for the Canadian Navy covered practically all branches of the service, but only specially qualified applicants have been entered.

H.M.C. Ships.—H.M.C.S. *Niobe* has been utilized as a depot ship at Halifax and H.M.C.S. *Rainbow* has been placed on similar service at Esquimalt. Submarines *CC 1* and *CC 2* and their parent ship, H.M.C.S. *Shearwater* have been engaged in trade protection duties where most required. A large number of other vessels have been employed on the various services of this department connected with the war. With the inauguration of unrestricted submarine activities by Germany, the possibility of an attack on Canadian coast towns and ports has greatly increased, and the defensive measures have been accordingly enlarged. It is not considered advisable, at the present time, to give details of the activities, offensive and defensive, of the department, or of the movements of any of H.M.C.S. ships.

During the last session of Parliament an Act entitled "Naval Discipline (Dominions Naval Forces) Act" was passed. The purpose of the Act is to bring the Canadian Navy in line with the other British Dominions' Navies in regard to their disciplinary relations with each other and with the Imperial Navy. The Act will greatly facilitate the combined efforts of the Imperial and Dominions' Navies in the prosecution of the war.

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2. SURVEY OF TIDES AND CURRENTS.

The principal Tide and Current stations in Eastern Canada and British Columbia have been maintained in continuous operation throughout the year. These served primarily to improve the basis for the calculation of tide tables; they are also very useful as reference stations for the work that is carried on during the year in the observation of slack water in the passes, and at the summer tide stations in new localities.

During the summer of 1916, investigations were carried out in Chaleur bay and at the mouth of Miramichi river. Observations were taken at Shippigan and Miscou from which information has been compiled, which is of considerable value to the local fishermen. From this information, it was ascertained that the nature of the current is very peculiar, as the type of the tide is different at the two ends of the Gully, in Chaleur bay and on the open coast. After considerable investigations, it was found possible to bring the time at which the current turns into relation with one of the principal stations for which tide tables are published. Advance copies of the data compiled have been circulated throughout the region for the use of the fishermen. Observations were also taken at Port Daniel, Point Peter, and in Gaspé Basin. In Miramichi bay a new station was established on Portage island, which is used for reference in predicting the tides in the bay. The necessity for time tables in this bay is urgent, as vessels entering and leaving have to time their entrance or departure so as to pass the shoals at high water, or they could not take on a full cargo. The new station is much more dependable than those formerly operated farther in the bay as the tides are more regular near the entrance. Stations were also operated at St. Andrews, N.B., and at St. Jean Port-joli on the St. Lawrence, the latter through the co-operation of the Hydrographic Survey. The work of taking tidal observations at cape Tormentine in connection with the car ferry to Prince Edward island was continued throughout the season. The data for the time of the tides for points along the St. Lawrence above Quebec have been improved by comparison with the observations obtained for the Waterways Commission by the Hydrographic Survey. The changes in the values are slight, as there is already a good basis for them; but the additional information throws some light on the variation which occurs in the run of the tide during the course of the season. The time of the tide is distinctly affected by the freshet which maintains the water at a high level in the months of May and June. The chief difficulty in dealing with this variation is that the amount of freshet differs in different seasons. As observations have now been obtained throughout a great number of seasons, it is possible to arrive at improved data for the tables which are published for cape à la Roche and St. Augustin bar.

Improvements to the tide tables for Port Nelson were made as a result of observations taken by the wireless operator stationed there. The time values for these tables are based on the difference with one of the harbours on the North sea at which the tides are of the same type; the height of the tides is calculated directly from the moon's position.

During 1917, investigations were carried on inside Vancouver island to the limit reached by the tides which entered by Queen Charlotte sound, and also to the extreme

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northern end of the strait of Georgia. For this purpose tide gauges were placed at the Glendale cannery in Knight inlet, and observations were also taken at Redonda cannery in Deceit bay at the northern end of the strait of Georgia. The tide at the northern end of the strait of Georgia is practically simultaneous with the head of Bute inlet, and thus affords the limiting value for the tidal differences in the strait of Georgia. A tide gauge was also established at Squamish at the head of Howe sound. In the observation of the currents, the work carried out at the northern end of Vancouver island will assist materially in determining the exact time of slack water. This information will be of great service as these channels are extensively used both by the regular steamship lines and by the lumber concerns. Current observations were also carried out in Chatham channel, Cordero channel, Blind channel, and at Hole-in-the-Wall, which forms the narrows chiefly used in reaching the Yuculta, where observations were continued throughout the winter. It has been ascertained that slack water in these places can be referred to the time of slack water in Seymour narrows. This discovery has simplified the calculation materially, and it also makes the navigation of these channels much easier, as it is only necessary to apply a difference of time to the slack water tables as published for Seymour narrows.

Information in connection with tide levels has, during the year, been supplied to the city of Vancouver, the Public Works department, the Biological Laboratory at St. Andrews, the Faculty of Education in the University of Toronto, and to the department of Railways and Canals. A detailed report of the operations carried out in connection with the tidal and current observations of Canada has been supplied to the British Association in Manchester, England.

The information obtained from the observations taken at the different tide stations is published in the tide tables. Tide tables for the eastern coasts of Canada are published in three editions; one is a complete edition containing all tidal information which has a distribution of approximately 10,000 copies, the other two are abridged editions of pocket size, one for Quebec, Father Point, and the St. Lawrence, and the other for St. John and the bay of Fundy. These two additions now have a distribution of about 23,000 copies; the smaller editions are very convenient for the use of navigators and fishermen who require only local information. There are two editions of the tide tables for the Pacific coast; one edition contains complete tidal information for the whole British Columbia coast, and has a distribution of 18,000 copies. An abridged edition of the southern part of British Columbia is published, and has a circulation of approximately 9,000 copies. A small edition of the tide tables for Port Nelson covering July to October was also published. All editions of tide tables are supplied without charge.

3. HYDROGRAPHIC SURVEY.

Owing to conditions created by the European war, the work of the Hydrographic Survey has been greatly curtailed. The steamers *Acadia*, *Cartier* and *Bayfield* were taken over by the Naval Service branch, and used as cruisers for war work. The steamer *La Canadienne*, owing to the fact that the services of her crew were urgently required elsewhere was laid up at Owen Sound, and for the same reason, in addition to

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shortage of surveying officers, the schooner *Naden* was laid up at New Westminster, B.C.

Under these conditions, Capt. F. Anderson, who had in previous years been in charge of the *Acadia*, was appointed to prepare sailing directions of lake Superior.

Atlantic coast survey.—The other members of the *Acadia's* surveying staff were detailed to make re-surveys of the harbours on the northwest shore of the bay of Fundy. They lived on shore and were supplied with launches and boats. The party was organized about the 1st June, and the surveys were completed about the end of September.

In addition to surveying these harbours, they continued triangulation along the shore to connect them with one another and with the time ball at St. John, N.B. The work was very much impeded by fog and rain.

Upon completion of this work, the party proceeded to the St. Lawrence, where, with the aid of the steamer *Bellechasse*, borrowed from the Ship Channel, they measured, in detail, fifteen sections of the river for the purpose of enabling computation for back water to be carried on.

Lower St. Lawrence river survey.—Mr. Charles Savary, with his assistants, left Quebec on the 19th May with the motor boat *Brant*, to make a re-survey of the south traverse.

The triangulation was extended westward from the old site, Orignaux point lighthouse to Goose cape lighthouse as far as Goose island reef, and the shore traversed between L'Islet and St. Roche des Aulnais. The sounding was confined almost entirely to running lines across the channel between the banks lying off the southeast shore of the river and shallow water on the north side of the traverse. As a result of this work, it is hoped to issue a new chart of the South Traverse, more in detail and up to date.

Lake Superior survey.—Mr. H. D. Parizeau, with one assistant, proceeded to Port Arthur on the 7th June and, between that date and the 10th August, completed a re-survey of the harbours of Port Arthur and Fort William, using, as far as possible, the excellent surveys of the engineer of the department of Public Works carried out in connection with the harbour improvements there. It is hoped that the new chart resulting from this survey will be issued to the public during the coming summer.

On the 10th August, the party moved to the northwest shore of Black bay and pitched camp. The triangulation of the bay was carried out in preparation for the traversing of the shore and sounding. A small amount of the latter was done before the end of the season, and it is intended to complete this work during the coming summer.

Considering the unfavourable weather conditions very good progress was made by this party. The party discontinued work on the 15th October.

Kingston harbour.—Mr. P. Jobin, with an assistant, reached Kingston on the 15th May, and resumed operations on the survey of the entrance to Kingston harbour. The department of Public Works launch *D. P. W.* loaned to the surveying party

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through the courtesy of the Public Works department, was of great assistance in the conduct of the work.

Work was carried on all summer, but there is still a small amount to be done to complete the survey. The plan is, however, in such shape that a chart may be issued to the public during the summer of 1918.

The party returned to Ottawa about the 1st December.

Pacific Coast survey.—Lieutenant-Commander P. C. Musgrave, and party, left for Hecate strait on the 11th April in the steamer *Lilloet*.

En route, an examination was made for a reported danger lying off Danger reef, but careful search failed to locate it. A re-survey was made of Margaret bay, Smith sound, to locate several reported dangers there.

The vessel also called at Ocean falls and made note of the alterations to the wharves, buildings, etc., to enable the chart of that locality to be corrected to date. Continuing north, surveys were also made of Milbank sound, Schooner passage, and an examination was afterwards made of a reported channel between Swindle and Princess Royal islands; the latter was found to be very narrow and not navigable.

Prince Rupert was reached on the 5th May, and the remainder of the season until the 1st October was taken up in the work of sounding in Hecate strait.

During October, work was confined to a survey of Petrel channel and Captain cove and the ship left for winter quarters on the 26th October. On the way south, opportunity was taken for making an examination of Swanson bay and Chatham channel for a rock that was reported to exist off Root point.

The weather proved very unfavourable for survey work in the areas covered. Out of a total of 176 working days, work was carried out on 70. Of the remaining 82 days, work was prevented by rain.

St. Lawrence stream measurement.—Stream measurement work in the St. Lawrence river was carried out at Victoria bridge and at Lanoraie. At the former, work was carried on from the 23rd April until the 18th August. Similar work was also performed in the Assumption and Ottawa rivers near the mouths and in the various channels through the islands opposite Sorel.

Twenty-eight sections for computing backwater were also carefully sounded in the river between Montreal and Three Rivers.

Automatic gauges.—The automatic gauges established in the Great Lakes and the St. Lawrence river were efficiently maintained during the past season. Two additional gauges were placed during the year, one at Iroquois, Ont., and the other at the upper end of the Morrisburg canal.

The following tables give the monthly mean surface elevations of the Great Lakes and the St. Lawrence river for 1917, by automatic water gauges, and are referred to mean sea-level.

Monthly Mean Water Surface Elevations of St. Lawrence River for 1917, by Automatic Water Gauges. Elevations are in feet and are referred to Mean Sea Level.

Location.		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Mean.
St. Lawrence River	Iroquois Canal, lower entrance, Lock 25										229.28	229 17	228 82	
	Morrisburg Canal, lower entrance, Lock 24										225 79	225 56	225 29	
	Pointe Claire	69 40	68 75	68 31	70 40	70 64	70 81	70 23	69 56	68 77	68 59	68 82	69 92	69 43
	Verdun					35 36	35 45	35 15	34 88	34 54	34 45	34 52		
St. Lawrence River	Lower entrance, lock 1, Montreal					24 73	24 73	23 41	22 27	20 87	20 78	21 21		
	Laurier Pier, Montreal					23 69	23 76	22 29	21 17	19 77	19 71	20 12		
	Longue Pointe					23 50	23 44	22 05	20 92	19 51	19 45	19 86		
	Varembes					22 21	22 11	20 58	19 39	17 88	17 89	18 48		
St. Lawrence River	Varembes					20 94	20 82	19 21	17 99	16 51	16 61	17 06		
	Lamotane					19 33	19 22	17 53	16 33	14 78				
	Sorel	17 18	17 38	18 03	20 64	18 72	18 62	16 61	15 78	14 28	14 56	15 66	16 60	16 98
	Curvo No. 2					17 22	17 27	15 45	14 30	12 66	13 07	13 64		
St. Lawrence River	Nicolet						17 01	15 25	13 97	12 30	12 75	13 35		
	Three Rivers					16 70	16 60	14 82	13 62	11 97	12 43	12 82		
	Patissem.						13 18	11 64	10 70	9 27	9 86	10 15		

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Issue of Charts.—During the past year the following new charts were issued by the Hydrographic Survey:—

- No. 66.—Approaches to Niagara river.
- No. 93.—Byng inlet and approaches.
- No. 63.—Toronto to Niagara river.
- No. 70.—Harbours in lake Ontario.
- No. 73.—Harbours in lake Ontario.
- No. 412.—Gulf telegraph.
- No. 102.—Lamb island to Thunder cape.
- No. 410.—Bedford basin.
- No. A.—Gnomonic outline chart.

The following new editions of former issues have been published:—

- No. 81.—Collingwood and approaches.
- No. 83.—Waubashene to Western island.
- No. 101.—Head of Thunder bay to Pigeon river.
- No. 100. Georgian bay.

The charts of the International Waterways Commission, showing the boundary line between St. Regis, Que., and Pigeon bay, are still with the printers, but as the final proofs have been returned it is hoped that they will be issued to the public this summer.

4. STORES BRANCH.

The work of the Stores branch is divided into three main divisions, viz: The purchasing section, the storekeeping section, and the transportation section.

Purchasing division.—The expansion of the department during the past fiscal year has been reflected in the Stores branch and in the Purchasing division to a greater degree, perhaps, than in any other. The work has increased and developed, and the difficulties of obtaining supplies have multiplied greatly, but in spite of many obstacles the demands upon it have been successfully met. Purchases aggregating \$10,074,643, were executed, an increase of approximately 33 per cent over those of the year previous.

Contracts were maintained on both coasts for supplies of fresh provisions for the convenience of ships operating in adjacent waters. These were made applicable to, and were taken advantage of, by ships of the Imperial as well as by ships of Allied Governments, while stocks of staple provisions were maintained in the dockyards at Halifax and Esquimalt for ready issue as required. Expenditures under this head totalled \$2,911,644.

In like manner contracts were also maintained for fuel. Expenditures under this head totalled \$2,771,879.

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Clothing to the value of \$929,398 was purchased. Exceptional difficulty was experienced in this connection owing to the great scarcity of raw materials. The situation in this respect is becoming daily more acute, and the future holds little prospect of relief.

Purchases of medical supplies to the value of \$25,034 were executed.

Naval stores, including lumber, metals, cordage and textiles, oils, paints, packings, etc., and electrical stores, to the value of \$2,454,755 were purchased.

As in the past, practically all supplies of ordnance and ammunition were procured from the Imperial Government. Liability to the extent of \$136,680 was assumed in this connection.

All supplies of stationery and printed matter were procured through the Government Stationery and Printing department. These totalled in value \$350,125.

Miscellaneous demands presented by the Fisheries, Hydrographic Surveys, Radiotelegraphs, Fishery Protection, and other branches of the department were dealt with successfully, resulting in purchases aggregating in value \$498,128, exclusive of stationery and printing.

Storekeeping division.—The extension of naval activities in Canadian waters during the year under review has been felt to a very marked extent in the work of this division. The opening up of new supply bases to meet the requirements of the large number of vessels which have been added to the naval establishment and the arrangement of the necessary facilities to supply all requirements with despatch are the outstanding features of the year's work. The extension of the facilities afforded the Imperial service and the large increase in the value of supplies issued to these ships have brought about a closer relationship between the department and the British Admiralty; in consequence of which a considerable modification of our supplies systems has been necessary. Notwithstanding the stress of conditions which have obtained during the year, particularly at Halifax, due to the disaster of December 6, 1917, the new organizations are proving effective and have already resulted in greater efficiency in supplying the requirements of all services based on Canadian ports.

The fundamental work of the branch being the prompt and expeditious supply of the necessary stores and equipment, and guns and ammunition to the fighting forces of the service, first attention is given to this work. Notwithstanding the difficulties which have been experienced in procuring supplies of all kinds, and in matters of transportation, satisfactory results have been obtained. All ships, whether Canadian, Imperial, or those of Allied Governments, have been afforded the same facilities and in no cases have serious delays occurred in supplying their requirements for maintenance or carrying out necessary refits.

Besides the increase of the number of other vessels, 70 ships have been added to the naval establishment, of which 19 were purchased or built, 4 chartered, and 39 trawlers and drifters built for the Imperial Service, but employed under the control of this department. Seven vessels previously employed have been returned to their owners. A number of vessels formerly employed in the Fishery Protection, Hydrographic or other auxiliary service under the department have been transferred to war

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service under the White Ensign. In addition, a large number of motor launches have been employed, many of which were purchased outright.

In addition to men-of-war and other naval establishments, service has been rendered to all the auxiliary services connected with the department. These include the Fishery Protection service, the Examination service, the Hydrographic Surveys, the Radiotelegraphic service, the Tidal and Current Surveys, the Life-saving service, the Fish-breeding service, and the various other fishery establishments throughout the country. The great differences between these services and the nature of their requirements occasion considerable difficulty in supplying their needs and involves to a considerable extent the carrying of supplies of a special nature which are for the most part totally unsuited to naval requirements. With each succeeding year, greater strides are made in standardizing their requirements, with corresponding increased efficiency.

The provision of the necessary reserves at Halifax and Esquimalt dockyards has proved a somewhat difficult task, particularly in the case of Halifax, where the destruction caused by the explosion and the inevitable disorganization of the supplies system were very great. Storehouses and large quantities of stores were either destroyed or badly damaged, transportation for a time at least was completely disorganized. The personnel of the staff suffered considerably from the effects of the explosion. Under these trying conditions, the effects of which were felt beyond the end of the year, the task of maintaining the supply organization with the required effectiveness was a difficult matter, calling for much extra work under most trying conditions on the part of the dockyard staff.

As in the past, the variety of stores maintained for all services is wide, and includes all stores and supplies, guns, torpedo stores, and ammunition required by all classes of ships under the department; stores and material in connection with the maintenance of a dockyard and dockyard workshops; provisions, all necessary clothing and medical supplies for the personnel of the naval and auxiliary services; and building materials. Particular attention is given to the inspection of supplies, especially in the case of those required for the use of ships, owing to the particular nature of their requirements.

For the purpose of attaining greater efficiency and economy, every endeavour is made to standardize all stores handled. Satisfactory progress has been made in this direction during the year.

The quantities and varieties of the reserves have been materially increased on account of the large number of ships which have been commissioned in the year. Provision was made at the beginning of the year for the anticipated requirements of all services based on Halifax and Esquimalt. The total value of deliveries at Halifax amounted to \$2,825,800, and at Esquimalt \$782,594, an increase of \$2,020,518 and \$212,098, respectively, over last year. The transactions involved in these deliveries number, at Halifax, 9,552 and at Esquimalt 4,674.

The issue to ships and establishments have similarly been greatly increased. At Halifax, the value of issues amounted to \$1,947,935, and at Esquimalt, \$607,544, an increase of \$1,323,404 and \$84,552, respectively. The number of transactions involved were 24,180 at Halifax, and 15,840 at Esquimalt.

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At the beginning of the year the value of all stocks carried at Halifax and Esquimalt was \$488,150 and \$534,816, respectively. The values of the stocks at the end of the year were approximately \$1,397,620, at Halifax and \$644,795 at Esquimalt. Owing to the explosion, and the pressure of work which followed, it was not possible up to the end of the year to ascertain the full extent of the damage caused by the disaster of December 6, and consequently the value of the stock at Halifax is an estimate.

The policy of the department to afford every possible facility to ships of the Imperial and Allied Governments has been continued. In many instances, it has been necessary to increase the reserves and to extend the supply organization to a considerable extent on this account.

In addition to issues made direct to ships in the ordinary way, very large quantities of stores have been supplied to the Imperial Government, full details of which cannot be given at the present time.

Large reserves of steaming coal are maintained at both dockyards for Canadian and Imperial requirements. The total receipts during the year at Halifax amounted to 89,998 tons, and at Esquimalt 17,974 tons. The issues at Halifax were 89,722 tons, and at Esquimalt 13,788 tons. The greater part of these quantities being of Admiralty coal, the values are not included in the value of the purchases. In addition the following quantities of Canadian coal were handled on direct issue to ships from contractors, viz.—

At Halifax and the East coast..	88,240 tons.
At Esquimalt and the West coast..	13,966 "

Supplies of fuel oil have also been maintained at both dockyards. In the year the following quantities were handled:—

At Halifax..	74,309 gallons.
At Esquimalt..	9,000 "

During the year, the work of drawing up established allowances of stores for all the ships in the service has been completed and scales of allowances prepared for deck and engineer's stores for each vessel. Under this system, whereby ships are restricted to certain specified supplies, to meet their general requirements, economies are effected and an opportunity afforded to reduce the variety of stores handled to a minimum. Ships and establishments, as well as the dockyards, make an accurate accounting of all stores received and expended and at the end of a stated period forward the accounts to headquarters, for audit. In this way a thorough check is maintained at all times to protect government property and to keep the individuals concerned on the alert to prevent unnecessary expenditures or loss by neglect or theft. In the year, a large number of stores accounts have been audited with satisfactory results.

The system of biennial stocktaking, by means of which the whole of the stock is reviewed in its entirety every two years, was continued during the year. At Esquimalt, very satisfactory progress was made with gratifying results. At Halifax, however, owing to the great pressure of work and the disaster of December 6 coming at the time when the most progress would have been made in this work, it was not possible to completely carry out the schedule of stocktaking. Under the circumstances, the results obtained may be considered as satisfactory. Following the explosion steps

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were taken to ascertain by actual stocktaking the extent of damage done, but up to the end of the year it was not possible to complete this work.

During the year it was found necessary to abolish the contract system hitherto in force of victualling the ships' companies of the smaller vessels, whereby the stewards, for a daily rate for each member of the ship's complements, provided all necessary provisions. This system proved generally unsatisfactory owing to the varying conditions under which the stewards laboured and their inability to purchase at all times to the best advantage. On May 1, 1917, all vessels were placed under the General Messing system, and all provisions supplied by the Government according to standard ration scales and under the supervision of a Victualling officer at each naval base. This system is proving satisfactory and has reduced the cost of victualling these ships to an appreciable extent.

Transportation.—The arrangement under which the department, in conjunction with the Director of Overseas Transport, is responsible for the necessary work in connection with the export of material on behalf of the Imperial Government has been continued in force and greatly expanded during the financial year 1917-18.

The department of the Naval Service controls the movements of all ships, and is the medium of communication with the Admiralty on all matters of policy. All expenses in connection with the service are defrayed by the department on behalf of the Imperial Government on presentation of duly certified invoices. Accommodation as necessary has been arranged for at the various ports. The facilities of the shipping companies have been placed at the disposal of the Transport service as required. Advantage has been taken of these to a large extent and a very great debt of gratitude is owing to shipping and transportation interests for continual assistance and ready co-operation in all matters relating to the service.

Contracts have been made for the supply of bunker coal, as necessary; 242,000 tons have been purchased from Canadian firms for vessels in the service during the year ending March 31, 1917.

Arrangements have been made as necessary for the repairs and fitting of ships for special purposes, and for the supply of such provisions, stores, and gear as are required while the ships are in Canadian ports.

This service from a small beginning has become a very large undertaking. The average export movement for the year ending March 31, 1918, amounts to more than 360,000 tons per month, or roughly, fifteen fully loaded freight trains of material per day. The monthly total now exceeds 400,000 tons, and the sailings two per diem. This traffic originates in all parts of Canada, and the work of organizing its transportation to the ports of shipment is very great. The services rendered by the Director of Overseas Transport and his staff in this connection cannot be overestimated.

The organization has worked with the greatest regularity and despatch. Practically no delays have been experienced throughout the period of review. The movement has been rendered possible only by the ready co-operation of all transportation companies with the staffs of the service in all matters.

The traffic handled includes forage, grain, timber and miscellaneous provisions, shell and ammunition of all kinds, militia stores, Admiralty supplies and miscellaneous raw materials and manufactured articles of a great variety.

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The greater part of this traffic has been handled through the port of Montreal during the season of navigation, and from Halifax and St. John during the winter months. Portland and Boston have also been made use of during the winter months.

In view of the importance of utilizing to the utmost every ton of shipping on the service, no efforts have been spared to give each ship the promptest despatch possible and to so distribute the different classes of freight among the ships sailing so that each ship takes a full cargo, with no vacant space. The following statement shows the disbursements on account of the Overseas Transport Service, April 1, 1917, to March 31, 1918:—

Bunker coal..	\$1,259,000
Stevedoring, ship's accounts, etc..	2,841,000
Repairs, fittings, alterations..	227,000
	<hr/>
	\$4,327,000

The thanks of the department are due to the Canadian Pacific Railway company for the loan of transportation experts to carry on this work. Their work has largely contributed towards placing the service in the position it now occupies. The satisfactory manner in which the larger transportation questions arising have been dealt with, as well as the vast amount of detailed work performed, show in a remarkable way the value and efficiency of their organization.

5. CANADIAN ARCTIC EXPEDITION.

The Canadian Arctic Expedition, under the leadership of Vilhjalmur Stefansson, set out for the Arctic regions in the summer of 1913.

The departments of the Naval Service and Geological Survey are interested in the results of the expedition and are co-operating towards its success. Its general direction is entrusted to the department of the Naval Service.

The work planned for the expedition comprised the exploration of Beaufort sea, the investigation of animal life in the areas covered, and the taking of soundings. The expedition was also to ascertain if land hitherto unknown exists and to definitely mark any found. The investigation and areal mapping of the copper-bearing and associated rocks of the main land between cape Parry and Kent peninsula for approximately 100 miles inland and of the southern and eastern shores of Victoria island were also to be undertaken.

Owing to the varied nature of the work and the vast area to be investigated, it was found necessary to divide the expedition into two parties; the northern division to carry on the Beaufort sea work and the southern division to carry out the surveys of the Canadian mainland and Victoria island.

Southern division.—The southern division have completed their work and have returned from the north. A complete report of operations by Dr. R. M. Anderson, executive head of the southern division, was published in the annual report of the department of the Naval Service for the fiscal year ended March 31, 1917, pages 28-64.

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Northern division.—The northern division, in C.G.S. *Karluk* sailed from Nome, Alaska, on July 20, 1913. The party in the *Karluk* met with very heavy ice conditions shortly after entering the Arctic, which prevented them from attaining any base on the northern islands (Prince Patrick or Banks islands) in 1913. They were carried about by the ice, the general drift of which was at first easterly along the north coast of Canada. When near Thetis island, the drift ceased and it appeared that the vessel was frozen in for the winter.

Mr. Stefansson, accompanied by B. M. McConnell, George H. Wilkins, and D. Jenness undertook a hunting trip to the mainland. During their absence, the ice drift again set in and the *Karluk*, with the remaining members of the party, was carried away. The ice drift took a westerly direction, and the party were carried about until January 11, 1914, when the *Karluk* was crushed and sank. A chart showing the drift of the *Karluk* was published in the Naval Service annual report for the fiscal year ended March 31, 1915.

Full details of the difficulties encountered by the *Karluk* party in their endeavour to reach land have been given in previous reports published by this department. Before they were finally rescued from Wrangel island, eight of their number lost their lives through endeavouring to travel over the ice under poor travelling conditions, two died from sickness and one was accidentally shot. Eight survivors were taken from Wrangel island and landed at Victoria, B.C., by the United States Revenue Cutter *Bear*.

Ice expeditions.—The members of the Stefansson hunting party, who came to the mainland near Thetis island, when they found that the *Karluk* had been carried away, made their way westward and joined the other members of the expedition, who were wintering at Collinson point, Alaska.

Mr. Stefansson purchased the schooner *North Star*, partly for the supplies which went with the vessel, and also for the use of the vessel itself. Although the fate of the *Karluk* was not then known, Mr. Stefansson realized that it would not probably be available for use during the summer of 1914.

On March 22, 1914, a party led by Mr. Stefansson, set out on a journey across the ice to the north over Beaufort sea. They proceeded as far north as safety would permit, and covered an area of Beaufort sea hitherto little known. Towards the end of April, the ice began to break up and they were obliged to hasten towards land. They arrived at Norway island on the northwest coast of Banks island on June 25, and they spent the summer exploring and mapping northern Banks island.

In September, they went south to Kellett, where George H. Wilkins and a party in the *Mary Sachs* were met. The *Sachs* was beached, and a winter base was established at Kellett.

During the winter, investigations were continued, so far as the light would permit, in southern Banks island and along DeSalis bay and Prince of Wales strait.

Early in February, 1915, Mr. Stefansson, accompanied by Storker Storkerson, Ole Andrasen, and Charles Thomsen, set out from cape Alfred (Northern Bank island) on an ice journey, which was to cover that part of Beaufort sea west of northern Banks island and Prince Patrick island. They journeyed in a northwesterly

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direction until April 26, when, through ice conditions, they were forced to land on Prince Patrick island. From Land's End, Prince Patrick island, they followed the shore east as far as cape McClintock. As the ice north of this cape was still unbroken, they journeyed out upon it. After three days' travel they sighted land which was not marked on any chart. They reached the shore of the new land, but they were unable to make any extensive survey of it, owing to the advanced season. They hastened back to Kellett, taking a route which led to the east of Prince Patrick island, and arrived at the base on August 8.

Shortly after their arrival at Kellett, Mr. Stefánsson purchased the schooner *Polar Bear*, which arrived en route for a whaling and trading voyage along the northern coast. He set out in the *Bear* for Bailly island. He left instructions there for the *North Star*, until then used by the southern division, to go to Banks island, and establish a base as far north as possible on the west coast thereof. He then returned to Kellett and thence north along the east coast of Banks island. Owing to the lateness of the season, the *Bear* party were able to get only as far north as Princess Royal islands.

The vessel was put in winter quarters there and a base established about ten miles south of Armstrong point. From this point Storker Storkerson partially completed the mapping of the northeast coast of Victoria island.

Mr. Stefánsson himself made several trips during the autumn of 1915. He established a hunting camp at Hay point and later at Ramsay island, and also journeyed south along the coast as far as Minto inlet and thence across to Walker bay. On December 1, he left Ramsay island for Kellett. On this journey it was ascertained that many positions as marked on the charts are incorrect; necessary notes to correct these errors were made.

All was well at the Kellett base upon the arrival of the party there. The *North Star* had followed the west coast of Banks island to a short distance north of Norway island, where its progress was stopped by the ice.

On January 6, 1916, Thomsen, Noice, and Knight were sent from Kellett to the *Polar Bear* base with instructions to Storkerson giving details of the plans for the coming spring. The men who remained at Kellett prepared to journey north to cape Alfred, where they were to meet the *Polar Bear* party. From this point the two parties were to unite in carrying out exploration trips during 1916, over Beaufort sea to the north west of Prince Patrick and Banks island, it being a part of the instructions sent to Storkerson that the *Polar Bear* was to be brought as far north as possible during the Summer. They also planned to survey as far as possible the new land discovered the previous year. Owing to delays experienced by Thomsen and his party, the *Polar Bear* base did not receive the instructions soon enough to join the Stefánsson party at cape Alfred.

The Cape Alfred party delayed starting owing to the non-arrival of Storkerson, until March 7, which was too late a date to start on an ice expedition. On that date Mr. Stefánsson set out for Mercy bay to cache gasoline and to learn if any of the *Polar Bear* party had visited the bay. The remainder of the party were employed in bringing supplies east for use in the New Land work.

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These plans necessitated the temporary abandonment of the *Star* and all the party proceeded either to Melville island or to the New Land for the year.

During these journeys it was found that for forty-five or fifty miles west from Mercy bay no point on the coast corresponds with Admiralty Chart 2118. A big bay, shown by Chart 2118 as just east of cape McClure, does not exist, although there is, some six miles west of Mercy bay, another bay of considerable size.

When the parties travelling along the coast of Bank island found no sign of Storkerson, all hope of his arrival at cape Alfred was given up, and the party decided to break camp and move to Melville island. At Mercy bay a letter from Storkerson was found, in which the reasons for the change of plans were given. From this letter it appeared that a party would be able to get in touch with the Storkerson outfit by proceeding to cape Ross, Melville island, where a party would be left in charge of supplies. The Stefansson party accordingly proceeded to cape Ross where the remains of a camp, a small cache, and a further note from Storkerson were found. A few days later one of the members of the Storkerson party arrived and gave complete details of the movements of the *Polar Bear* party. Storkerson and his men had proceeded directly to the New Land as he considered that Mr. Stefansson would desire to make a survey thereof rather than conduct further ice trips. The Stefansson party immediately set out for the New Land where they caught up with the *Polar Bear* party towards the latter part of April, 1916. The following disposition of the different members of the party was immediately made, in order to obtain the greatest results from what remained of the season. Thomsen was sent south to Kellett with mail and scientific specimens; he was then to return to Melville island, where he was to help put up dried meat for the next spring's work. Storkerson was sent back with Thomsen as far as cape Ross; he was there to manage the gathering of meat on Melville island, after which he was to continue the mapping of Victoria island. Stefansson himself desired to carry on survey work over the New Land and also to endeavour to make any ice trips in the vicinity which the condition of the sea ice would permit.

Instructions were sent to the *Polar Bear* to proceed as far north as possible during the summer of 1916, so that a more northerly base would be available in the vicinity of Melville island for the summer work of 1917.

As previously un-named places, which do not show on the chart, were discovered during the summer of 1916, the following distinction will be made in describing the course of exploration. The New Land discovered in 1915, which is in reality two islands, will be called "First Land". "Second Land," is situated northeast from Ellef Ringnes island, and is triangular in shape; "Third Land," is southeast from "First Land," and is located directly north of the strait between Melville island and Bathurst island. Their geographical positions will be given in the course of this report.

On May 4, Castel, with Andersen and Noice, were sent northward from cape James Murray, which proved to be the western tip of First Land, to continue the survey begun by Storkerson on May 1. Storkerson started south for Melville island to carry out the plans already outlined, and Thomsen was despatched south to Kellett with mail.

On May 8, Mr. Stefansson, accompanied by Natkusiak and Emiu, with two teams, set out and overtook the Castel party about twenty-two miles from cape

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Murray. The weather had been so thick that the survey party had never been able to see over two miles, and commonly only a few hundred yards. The coast trended much more easterly than the party had expected. They continued after May 8 to have continual thick weather. Although Storkerson had reported the existence of land north by west from cape Murray, they were unable to see it, but this was probably the result of the atmospheric conditions.

The point where the Oastel party was overtaken, is near the northeast corner of island "A," "First Land", which is the more westerly and which is almost due north from Prince Patrick island.

From this point, the party crossed over to island "B" and followed the coast northeasterly.

Late on May 12, the weather cleared and the party were able to see land bearing northwest. They were unable to ascertain if this land is a separate island or part of the same island on which they were travelling; they crossed over to it in a northwest by westerly direction, covering a distance of about twelve miles. Mr. Stefansson decided that it was most advisable for the party to continue their work along the Beaufort sea shores rather than follow the coasts of landlocked seas and deep bays.

Whilst the party were crossing the weather continued thick and they were unable to see land until within a quarter mile of it. They followed the course first south-westerly and then westerly, gradually turning northwest, north and northeast for two days. On the third day, they left the shore and camped by the floe edge some 6 or 8 miles from land to get soundings, observe the currents and secure seals for food. Along this coast a line of reefs extends, close to which the ice breaks off and goes abroad periodically at all seasons. About 400 yards from one of these reefs the party got a sounding of 65 fathoms; the slope of the sea bottom is, therefore, similar in this region to what it is in the strait between Banks island and the mainland, and also between Banks island and Prince Patrick island, but different from that west of Barnett Bay, Banks island, and Lands End, Prince Patrick island, where a similar depth would be secured only ten to twenty miles off shore.

Owing to injuries sustained to his ankle Mr. Stefansson was obliged to alter his plans somewhat. The following extract from his diary, under date of May 20 indicates his change of plans: "May 20, 1916—I am sending Castel and Noice with one sled, nine of the best small dogs, and provisions for forty days for men and thirty days for dogs to go along the land east, and from it to cape Isachsen if our land does not continue northerly, and thence north so far as they can, aiming to be near the northeast corner of Melville island July 1. We shall rest the poorest dogs here for a day or two more and then proceed slowly north along the floe, following it possibly a considerable way if it trends differently from Castel's course. I then intend to spend the summer in island "A", First Land, perhaps at cape Murray, to observe the ice action, put up meat, etc."

Castel and Noice left the Stefansson outfit on May 21. Stefansson, with the four remaining members of the party, proceeded along the floe, taking soundings and current observations. The floe proved to trend in a general way towards cape Isachsen. The ice outside was in continual motion, and few seals and no signs of bears were found. The absence of seals was attributable to the condition of the ice, as there

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would probably be a large number of them in this area at the same season another year when ice conditions would be better. The land to the south soon disappeared from sight and the depth of water was from 100 to 233 fathoms. While they were out of sight of land the party found that the current was generally from northwest to southeast, and alternated with the tides. The current, although strong, never moved the ice noticeably off shore, though it was in continual slow motion generally at right angles to the currents, and most frequently to the southwest. It is considered, therefore, that, a few miles outside the floe edge, the tide currents observed by the party were neutralized either by the slack water of the more open ocean or by a current flowing generally southwesterly.

On May 31, the party camped at a huge pressure ridge just off shore from cape Isachsen, where they took tidal and current observations every ten minutes for twenty-four hours.

On June 2, while they were encamped near cape Isachsen, Castel's party arrived from the south. Although the Stefansson party had travelled slowly along the floe, partly to take observations and partly to rest their dogs, the Castel party was even more delayed owing to the very much heavier load which they were carrying.

Mr. Stefansson continued his journey from cape Isachsen in a general direction towards cape Thomas Hubbard (the north end of Heiberg island). In this way he would join up his exploration trips with those of Peary and McMillan. He sent Castel, accompanied by Natkusiak and Emiu, south with the following directions: The party were to proceed with reasonable speed, to meet Storkerson's party in Melville island. If they found that First Land, Findlay island, and King Christian island were the same (the position of these islands are somewhat indefinitely charted), they were to cross overland or to go east around the land as seemed best, but if First Land and the above-named islands proved distinct lands, they were to map the east coast of the First Land as best they could, and leave for Melville island only when the coast began to trend westerly. On the southeast corner, or the south coast of First Land, they were to cache supplies, food, etc., for the Stefansson party, as a reserve for their return south. They were also to leave notes of information at prominent points on their way. When they met Storkerson's party in Melville island, Castel was to stay to assist Storkerson, Emiu was to go to the *Polar Bear*, provided he found an opportunity, and Natkusiak was to take the best party Storkerson could give him and proceed to cape Murray, where they would meet the Stefansson party on their return. Stefansson intended to spend the winter in First Land and maintain there a base from which ice work could be carried on during 1917. With the supply of dried meat laid up by Storkerson on Melville island, and with a base on First Land, he felt that even though the *Polar Bear* failed to reach a more northerly base, the party would be in a good position to carry on extended ice journeys during the next season.

At cape Isachsen the Stefansson party got a good sight of the sun and were able to establish their position, and thereafter they reckoned their movements in meridian distances east and west of this point.

The Stefansson party left cape Isachsen on June 4, following the floe towards Heiberg island. They found much snow and considerable rough ice, which resulted in heavy going; in consequence they had much trouble with their dog harness, which broke frequently.

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Their general course up to June 13 was a little east of northeast. They took several soundings with a greatest depth of 114 fathoms. The strong currents noticeable southwest of Isachsen were not found northeast thereof and in many instances, they got no current observations.

On June 13, they saw New Land to the northeast. From the point where land was sighted the cliffs of the Christopher peninsula could be seen on the sky line to the south southeast.

They reached the New Land (Second Land) on June 14, at a point near N. Lat. $79^{\circ} 45'$, W. Long. $101^{\circ} 15'$ (by reference from cape Isachsen). They endeavoured to carry on a survey of the coast but this was very difficult owing to the weather conditions, which at this time of the year rendered survey work almost impossible.

A mile or so east of their landing place, and about half a mile inland a sand beacon $3\frac{1}{2}$ feet high was built on top of a hill estimated at 150 feet. A T-shaped box-board mark with "Canadian Arctic Expedition, June 15, 1916" was erected on the beacon. In the beacon also was placed a record telling of the discovery and landing, and taking possession of the land for the British Empire; it is signed by the three members of the party.

On June 17, the party set out in a northwesterly direction along the coast. They rounded the north point of the land on June 18, which is about $80^{\circ} 10'$ N. Lat. 100° W. Long. Second Land is, therefore, an island under thirty miles in north-south diameter.

The party remained on Second Land for a few days to get a good reading of the sun. June 22 proved a clear day. From the hills near the coast, which are about 300 feet high, Heiberg Land could be seen, apparently quite near to cape Hubbard. Heiberg Land is considerably more rugged than Melville island, and there appears to be glaciers on it.

In a small stone beacon near the beach, at their most northerly camp, some four miles south east of the north tip of the island, they left a record stating the course which they intended to pursue, which was signed by all members of the party. A survey of the east coast of Second Land was completed on June 28, and the party also located, by triangulation, several small islands in the strait between Second Land and Heiberg island. From this triangulation it would appear that Heiberg Land is only about half so far away as it should have been by the chart; the error may have been in the watches, but as they later got for them the same rate which they had before starting, it seems more likely that either cape Isachsen is charted too far west or the coast of Heiberg island too far east. The question of these positions will, no doubt, have been definitely determined by Mr. Stefansson after obtaining observations at Winter harbour, which point is definitely located.

From Second Land the party crossed over to the west coast of Amund Ringnes island, just west of cape Sverre. From the Sverdrup charts it was thought possible that Hassel sound was in reality not a sound, and that the two Ringnes islands were connected. This was found to be far from the case, as instead of being narrower, the sound was found to be much wider than charted, being not less than 15 miles across at the narrowest part. If cape Isachsen is correctly located, the widening of Hassel sound decreases the size of Ellef Ringnes island as shown on the chart, by moving its coast westward.

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The party lost four days in Hassel sound owing to snow blindness, and were delayed two days longer through an accident which resulted in the up-setting in the water of their load.

On July 14, they set out across the strait from North Latitude $78^{\circ} 17'$ and landed on Ellef Ringnes island near North Latitude 78° , three days later. On leaving Amund Ringnes island a sounding of 2 fathoms was obtained $1\frac{1}{2}$ miles from shore, and $2\frac{1}{2}$ miles from shore they took 73 fathoms. Travelling at this season of the year was becoming very difficult, owing to the amount of water on the ice.

At Ellef Ringnes island near North Latitude $78^{\circ} 10'$ tidal observations were taken covering a period of twenty-four hours on July 18.

Some fourteen miles beyond the point where the tidal observations were taken a cairn was located, in which a record of the Crocker Land Expedition, under MacMillan was found. Following is a copy of the record:—

EASTER SUNDAY, April 23, 1916.

“Arrived here yesterday on my return from Finlay Land (King Christian island) to Etah, North Greenland.

“Shall leave here to-morrow for cape Ludwig. From there I shall proceed to North Cornwall, where I hope to find musk-oxen enough to map the east coast as far as Gordon Head.

“Expect to arrive cape South West about May 4 and Etah June 1.

“Thus far we have killed 13 bears, 13 seals, 16 hare, 2 ptarmigan, and 30 musk-oxen. Have three days' pemmican on our sledges.

“I have with me three Eskimos, Nucar-ping-wah, Arklio and E-took-a-shoo. Have lost eight dogs out of forty-seven, three with “piblockto,” three dropping on trail, and two killed by bears. All well.

(Signed) MACMILLAN.”

The Stefansson party kept the original record, but left a copy of it, together with a record signed by all members of their party, in the cairn, which they rebuilt.

From the MacMillan cairn they crossed over to King Christian island, taking soundings on their way. The currents across these straits alternated with the tides, and were strong.

They arrived at the south tip of King Christian island which, by observation, is in North Latitude $77^{\circ} 41'$ and about 103° West Longitude, on July 25. They were unable to go ashore owing to a lead of about 100 yards open water. They crossed to Findlay island, continuing sounding observations as they proceeded. From the action of the current they decided that King Christian island and Findlay island are separate islands.

On account of the bad going they did not reach Findlay island until August 4. This island is about twelve miles in its greatest diameter, and about 600 feet high. Paterson island, which they did not visit, is some eight miles to the south-east, and is about 300 feet high by about three miles long. About half-way between Paterson and Findlay there is another small island about 150 feet high. On this island seven fat carbou were killed.

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From the top of Findlay island, Mr. Stefansson got bearings of King Christian island, Helen island, and various points on Bathurst island. To the northeast, southeast, and south, all lands seen are indicated on Chart 2118, but to the northwest was a new land which was at first taken for the east end of First Land, but which proved to be a distinct island, about forty-five miles in diameter. A small island lies between the two lands.

As seen from a distance there appeared to be a wide gap between Findlay island and Third Land, but in reality there is a lowland shore to Findlay Island with a narrow shallow channel between it and the small island, and another channel about the same size between the small island and Third Land.

The party crossed over from Findlay island to Third Land, landing on the southeast corner thereof, on August 9. As the ice was in bad condition for travelling, they decided to spend the summer on Third Land and await the freeze-up.

Seals were remarkably scarce, but caribou were plentiful and were in very good condition, owing to the scarcity of wolves. There were from two to three hundred caribou in Third Land, of which the party used twenty-three.

Third Land is about forty-five miles long and twelve to fifteen miles wide, with main axis running north northwest and south southeast. The highest hills are about 400 feet. There were practically no foxes or wolves seen on the island, and very few traces of bears were found.

The northern point of Third island is located approximately in N. Lat. $77^{\circ} 50'$, W. Long. 107° . The southern tip is about N. Lat. 77° , W. Long. 106° , approximately. The island is oval-shaped, with fairly regular coast line.

On September 9, the party left the northwest corner of Third Land and landed on the east coast of island "B", First Land, near N. Lat. $77^{\circ} 50'$ on the 15th September. The distance across is about fifty miles. Owing to the thick weather they were unable to get a good sun reading during their stay in First Land.

As the winter darkness was quickly approaching, they were obliged to hasten south in order to connect with one of the parties operating in Melville island. They were unable to find any cache placed by Castel, who had been sent south in the spring to co-operate with the different hunting parties.

After visiting the beacon erected in 1915 at cape Murray, the party set out for Melville island, and reached Cherry point on October 2. On their way they mapped roughly the east coast of Emerald isle.

Owing to Castel's failure to cache provisions on First Land, the party on arrival at Melville island had only one day's food supply, but fortunately the day after their arrival was clear and they were enabled to kill two musk-oxen which was sufficient food to take them the rest of their journey.

On October 7, just west of cape Grassy, they met a party who were en route for the New Land. This party were unable to leave Melville island owing to the breaking down of their sled. Whilst they were encamped, pending the re-building of the sled, they discovered an easily workable coal mine three or four miles west of cape Grassy. The seam is of unknown thickness, as the lower part is covered with talus. It is not of uniform quality but much of it is apparently lignite, and some of it is rich

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in oil. A layer about 3 inches thick is a gummy substance resembling asphalt and burns when lighted with a match, somewhat like a lump of sealing wax. The coal can easily be secured at any season. The party who found the coal mine intended to await the arrival of early winter when they were to proceed to First Land in search of Stefansson and his companions.

The cape Grassy party was in charge of Natkusiak, who had mail from other members of the expedition for Stefansson. After a day's rest at Natkusiak's camp, the party proceeded south to connect with Storkerson, who was in the Liddon Gulf district gathering supplies and carrying out survey work in the vicinity of Victoria island. The Storkerson party were met on October 15. Both parties camped a few miles south of Liddon gulf.

During the summer the Storkerson party had killed 167 oxen, 40 seals, and 69 caribou. About half of this supply had been put up into dried meat, and much of the rest was partly dried. Whatever portions of this meat supply had not yet been hauled in, were brought to Storkerson's camp near cape Ross.

While in camp Storkerson reported to Mr. Stefansson the finding of a cable left at Winter harbour by Captain Bernier of the *Arctic* in 1910. Articles of value to the expedition were found in this cache, including shoes for sleds, pick-axes, and other tools. During the season Storkerson had also continued the survey of Victoria island.

The remainder of 1916, up to January, 1917, was occupied in storing provisions and transferring them to northern bases in order that a base well north might be established to start the spring work of 1917.

On January 17, Storkerson left the main base for Grassy with four teams and forty-three dogs, taking with him a load of dried meat and fat. He was to leave part of his party at cape Grassy, who would be employed for freighting work and hunting. From Grassy two teams were to advance to the southeast corner of island "B," First Land, where they were to make a cache of provisions and then return to Grassy. Mr. Stefansson proposed leaving the main base on or about February 15, proceeding directly to First Land, from which the spring's operations would be carried out.

The preparatory work for the spring's exploration had all been finished, but as yet no word had been heard from the *Polar Bear*, which had been ordered to go as far north as possible during the summer of 1916.

Just prior to leaving the Liddon gulf base, Stefansson was met by a party from the *Polar Bear*, who informed him that the vessel, instead of coming to the north during the summer of 1916, had been forced, through ice conditions, to go into winter quarters about 100 miles farther south at Walker bay.

On the evening of March 3, Storkerson who had accomplished his mission and had returned to the base, set out towards Grassy. Mr. Stefansson remained until March 5, in order to get a good time sight. He overtook the Storkerson party after one night's travel, and arrived at Grassy on March 11. For the next two weeks very severe weather was encountered. A continuous gale was blowing, and the thermometer registered from 53° to 57° below zero.

The dogs suffered considerably from the cold, chiefly from frozen flanks. To add to the delay of the party, the dog feed began to run short, and the exploring parties found it necessary to hunt.

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Owing to the weather conditions the party were unable to do any work until March 17, when an advance party set out towards the northeast corner of First Land. This party mapped the east coast of First Land on their way until it turned west, when they headed true north until they reached the shore floe. After having killed fourteen musk-oxen, the remainder of the party set out from Grassy for First Land, reaching the southeast corner thereof (cape Mamen) on April 1. This cape is $77^{\circ} 26' \text{ N. Lat.}$, $110^{\circ} 32' \text{ W. Long.}$ At the northeast corner of First Land (cape Malloch, $78^{\circ} 24' \text{ N. Lat.}$, $109^{\circ} 15' \text{ W. Long.}$) the advance party in charge of Castel was overtaken. From this point part of the party were sent back. They were to call at cape Grassy and take to the Liddon Gulf base, two Eskimos who had been left in charge there, and also any of the *Polar Bear* party who had not yet gone south.

By April 12, the ice party in charge of Stefansson had reached the shore lead northeast of cape Malloch. From this point they advanced in a northwesterly direction over the ice, until April 16, when the last support party under command of Storkerson was sent back. They were to travel together to the Liddon Gulf base, where they would separate, one party under Castel were to go to the *North Star* near cape Alfred, and on the way look for signs of Thomsen, who had been sent to Kellett with mail the previous year but had not returned. From the *North Star*, Castel and Andreassen were to map the coast of Banks island from Alfred to Kellett. Upon arrival there they were to assist in the launching of the *Mary Sachs*.

Storkerson, with the rest of the party from Grassy went south to the *Polar Bear*, from which base he completed the mapping of the northeast corner of Victoria island from Storkerson's own farthest of 1915 to Hansen's (Amundsen's) farthest of 1905.

After the return of the last support party Stefansson had two sleds and three men, i.e., Emiu, Knight, and Noice. By noon April 25 the party had reached a point about N. Lat. $80^{\circ} 30'$, W. Long. 111° . They had encountered no open water after leaving the shore lead, and consequently they were able to procure no seals or bears. On this account they were obliged to live almost entirely upon cereals so that their dogs might be fed the dried meat and pemmican which they had with them. Unknown to Mr. Stefansson, Knight and Noice had been living largely upon cereals throughout the whole winter, and the hard travelling brought on a slight attack of scurvy.

Principally on this account, Mr. Stefansson decided that it would be unsafe to proceed any farther over the ice, and turned back towards land. On the way back the party were annoyed by considerable crushing of the ice under the influence of strong winds and currents. No wide leads were encountered, but many large cracks in the ice had to be crossed, over which it was difficult to get the sleds. The winds were from southeast to south southeast mainly, and the drift was less than four miles in a direction east of north. The lateral motion of the ice was practically nil.

During the first week of May, Noice had become practically helpless. He was obliged to ride where the going was not very rough and when forced to walk the party had to travel very slowly to enable him to keep up. Although Knight was able to do some work, his health was, however, such that he was unable to offer as much assistance as the nature of the journey required.

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It was not till May 10 that they finally reached the shore floe, about fifteen miles northeast of where they had left it. On landing they headed directly towards the east coast of Ringnes island. On the same day they sighted land, and the next day they reached it and followed the shore some miles in the hope of obtaining some fresh seal meat. The next day they secured fourteen reindeer. The fresh meat revived the scurvy patients, who were able to continue in almost normal health within three days.

The party remained in camp until May 17, in order to allow the sick men to gain full strength, when they set out towards Third Land. At Third Land they discovered a coal mine a little south of the centre of the island. This mine may prove valuable for exploring parties, as it would furnish an ideal base to which it would be unnecessary to transport fuel.

On June 13 the party got time sights at their old summer camps of 1916, which enabled them to "tie up" their observations of 1916 with Winter harbour, Melville island.

They passed south through Byam Martin channel, following the coast of Melville island. South of Bradford point they encountered only level, young ice, showing that in the summer of 1916 there had been open water there, as well as farther south. From the condition of the ice they ascertained that the channel is subject to violent currents. Caribou and musk-oxen were plentiful ashore; many seals were seen when the weather was suitable.

The party did not hasten, as they considered that there was no reason for getting to Kellett much before August 20. They did not endeavour to go to Walker bay, but chose rather the known route over the Banks Island watershed.

They reached Dealy island on June 28, and remained there for five days. While there they examined carefully the articles that remained in the cache, left there by Captain Bernier.

The party left Winter harbour on the 15th July, heading for point John Russel, Banks island, as charted. They, however, found themselves headed to strike Victoria island, east of Peel point. This was afterwards explained when their observations showed point Russel to be really one degree farther east of Winter harbour than the chart indicates. They ran a line of soundings from cape Providence to point John Russel across Melville sound. The water deepens rapidly from both lands, and the bottom then shows unevennesses amounting to less than 70 metres in extreme range. The greatest depth is 485 metres. They got about 411 metres about 10 miles from Melville island, but the water shoals more gradually towards Banks island.

Travelling across Melville sound in the latter part of July was very bad. There were glare ice knolls, with channels and pits between filled with water, sometimes up to the hip. Another great drawback to travelling at this time of the year was the presence of "needle ice" which cuts the clothing and renders travelling almost impossible for dogs, whose feet become sore.

On July 25 they landed on Banks island, near point John Russell. While looking for caribou inland, Mr. Stefansson found on a level sand-bank north of a small river a copper cylinder badly soldered and full of wet sand. Imbedded in the core of sand was a record which, although badly decayed, was partly legible. This record was deposited by a travelling party from Her Britannic Majesty's discovery ship *Investigator*, which

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was sent in search of the expedition under Sir John Franklin. It was dated April 21, 1851, and signed by McClure.

The party also found a harbour a little north of point John Russell. They were unable to sound it, but judging from the ice there is ample water to float a good-sized ship. This harbour is an ideal point for a ship to stay awaiting an opportunity to cross Melville sound, as it is protected from all winds, and from the hills nearby a party could get a full view of Melville sound.

It is to be regretted that the *Polar Bear* was unable to get north to this harbour in the summer of 1916.

On the evening of July 28, Stefansson and his companions started south along the beach, with pack dogs, mapping the coast line as they went; they struck inland near North Latitude 73°. The country over which they travelled is rugged and full of lakes, some of them 15 miles long. One of these lakes is the source of a large river emptying near Mercy bay. The river has a surprisingly large drainage area and probably discharges more than twice as much water as any other stream in Banks island.

The crossing to Kellett was without incident, and they arrived on August 17. They found the *Mary Sachs* in such condition that they would be unable to use her to come out. At Kellett they also met two strangers, August Massik and Otto Binder, who had been left by Captain Gonzales of the *Polar Bear*, to guard a cache after that vessel left Kellett for the mainland.

Upon arrival at Kellett, Mr. Stefansson also heard the sad news of the death of two members of their party. Thomsen, who had been sent south with mail the previous year, reached Kellett in safety. Captain Peter Beneard decided to accompany Thomsen north in an endeavour to bring sleds, mail and other necessary articles to Melville island. These men lost their lives whilst trying to reach Melville island.

On August 26 the schooner *Challenge* arrived on a trading and trapping expedition at Kellett, and Mr. Stefansson purchased her and was thus able to reach the mainland.

On August 28 they sailed from Kellett and, on the following morning, overtook the *Polar Bear*, 30 miles east of cape Bathurst. Mr. Stefansson at once boarded the *Polar Bear* and left Castel in charge of the *Challenge*. Gonzales and Seymour of the *Polar Bear* reported that the ice in Franklin bay had not yet moved during the season, and that Bathurst could not be reached. They, therefore, put into harbour at Booth islands and later reached cape Bathurst (September 2, 1917).

As the *Challenge* was no longer of any use to the expedition, Mr. Stefansson sold it to Noice, Binder, and a Mr. Carroll (whom he had known ten years in the north), the first two of whom had been given their discharge from the expedition.

Many of the *Polar Bear* crew were also discharged as their services would not be needed whether the vessels were to come out of the Arctic or remain for the winter.

On September 13, the party had advanced to a harbour at the east end of Barter island, into which they made owing to the severity of the weather. During the night their anchor dragged and the *Polar Bear* went aground. As the delay necessary to take the *Polar Bear* off would render it too late to attempt any further advance, they decided to put her into winter quarters there. Mr. Stefansson, after having put the

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vessel into proper condition, immediately began preparations for an extended ice trip during the summer of 1918. He planned to go out on the ice to a distance of about 50 miles north of the path covered by the *Karluk* drift, and to float with the ice across the Arctic, landing on the Siberian coast.

In December, however, he took seriously ill with fever. Before he had fully recovered therefrom, pneumonia and pleurisy set in, which left him in a very critical condition. He was, with great difficulty, taken to Fort Yukon, Alaska, where he spent the greater part of the winter. He is, however, gradually regaining his health, and he will return to civilization in the summer or early fall of 1918.

The Southern division has surveyed those portions of the north coast of Canada hitherto uncharted, and has carried out extensive investigations of the mineral, animal, and vegetable life of the areas covered. They also made careful surveys of many harbours and rivers, and made a special study of the life-history of the Eskimos.

The Northern division has carried out very extensive ice journeys, covering large areas of Beaufort sea hitherto unvisited, and has also discovered new islands and surveyed the coast lines and definitely placed other lands, the position of which has been indefinite. Any new lands discovered have been claimed as part of the British possessions.

The full history of the Canadian Arctic Expedition, which, although handicapped by a series of unforeseen accidents, some of them fatal, has advanced the cause of science and has added lands to the British Empire, will be placed before the public at as early a date as possible.

6. RADIOTELEGRAPH SERVICE.

The total number of radiotelegraph stations in operation in the Dominion and on ships registered therein is as follows:—

Government Commercial Stations.. . . .	1
Coast Stations.. . . .	42
Government Ship Stations.. . . .	23
Licensed Ship Stations.. . . .	94
Public Commercial Stations.. . . .	3
Private Commercial Stations.. . . .	4
Radiotelegraph Training Schools.. . . .	4
Licensed Experimental Stations.. . . .	13
Total.. . . .	184

OPERATION OF THE COAST STATION SERVICE.

The Coast station services continue to be maintained on a war basis.

The total number of messages and words handled were as follows:—

	Messages.	Words.
East Coast.. . . .	36,771	820,230
Great Lakes.. . . .	16,809	307,729
West Coast.... .	147,885	2,308,261
Hudson Bay.. . . .	5,934	430,080
Totals.. . . .	207,399	3,866,300

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The amount of business handled by the East coast system shows a decrease from last year's business amounting to 1,064 messages containing 115,761 words.

The Great Lakes system (operated by the Marconi Wireless Telegraph Company of Canada, Ltd., under contract) shows an increase of 288 messages, with a total decrease of 4,071 words.

The West coast system (operated directly by this department) shows an increase of 26,765 messages containing 575,841 words.

The Hudson Bay system (operated by this department for the department of Railways and Canals) shows a decrease of 330 messages, with a total increase of 37,926 words.

REVENUE.

The total revenue collected during the year amounted to \$22,418.28 against \$16,731.33 in 1916-17.

The West coast service shows an increase of \$5,697.42, the Great Lakes a decrease of \$4.70, and the East coast a decrease of \$5.77.

EXAMINATIONS FOR CERTIFICATE OF PROFICIENCY IN RADIOTELEGRAPHY.

One hundred and fifty operators were examined during the year for certificate of proficiency in radiotelegraphy, including five re-examinations; seventy-six candidates were successful and seventy-four failed.

Five operators holding a certificate of proficiency in radiotelegraphy passed a successful examination in the operation of other equipments, and have had their original certificate amended accordingly.

ASSISTANCE RENDERED TO SHIPS DURING THE YEAR BY THE GOVERNMENT RADIOTELEGRAPH SERVICE.

The coast stations rendered assistance to numerous vessels on the west and east coasts during the year.

NEW CONSTRUCTION, ADDITIONS, AND ALTERATIONS.

West coast.—Estevan: A concrete foundation was built under the dwelling-house. A well was dug to a depth of 12 feet and a good supply of water is being furnished to each building.

Triangle island: The engines and wireless apparatus were thoroughly overhauled, and the inside tank and pump of building cleaned and painted.

Gonzales Hill: An extension has been built to the operating-house, approximately 15 feet by 25 feet, to give additional accommodation for the officer in charge and his staff to handle the largely increasing clerical work of the station.

Wireless workshop: The requirements of the radiotelegraph service having completely outgrown the accommodation available in the wireless workshop in the Esquimalt dockyard, and this latter being required for other purposes, a new workshop building has been erected on the drydock property adjoining the dockyard. All testing instruments and wireless apparatus and the two masts have been transferred to the new workshop which is now in efficient operation.

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East coast and Great Lakes.—No new construction work was undertaken on the east coast or on the Great Lakes.

GENERAL.

Since the outbreak of hostilities it has been found necessary to take over certain of the East coast stations, these stations are now being operated directly by the department for naval purposes.

The department has continued its policy of maintaining the apparatus on the different stations up-to-date (in so far as can be done without unreasonable expenditure), and the service continues to maintain a degree of efficiency which compares favourably with that obtained elsewhere.

The administration of the Radiotelegraph Act, with which this department is charged, has been carried on as usual and no evasions or attempted evasions of the section of the Radiotelegraph Act calling for the compulsory equipment of radiotelegraph apparatus on certain steamers have been reported.

In addition to the above section of the Radiotelegraph Act, regulation 23a of the "Defence of Canada Order, 1917" has been placed in effect. This regulation prescribes that on and after the first day of January, 1918, every British steamer registered in Canada, of 1,600 tons gross tonnage or upwards, sailing to or from any port in Europe or in the Mediterranean sea, shall be provided with an efficient radiotelegraph apparatus in good working order, with two certificated operators in charge.

An inspection service is maintained by the department, and vessels are regularly inspected to see that the law is being complied with.

TRAINING OF OPERATORS.

A training school was maintained at Halifax for the training of operators, but on account of the explosion the school has been transferred to Ottawa where a large number of learners are receiving instruction in wireless telegraphy.

The learners are recruited from a good class of men, practically all of them having passed their matriculation examination or equivalent, before joining up. At the school they receive a thorough grounding in operating procedure and technical matters, with the result that when they have completed their course, they required only a few months' actual experience to become qualified operators capable of taking charge of a ship station.

The school, although primarily intended for the training of raw men, will, as soon as the operator situation permits, be used to give junior operators an advanced course, which all operators will be required to take after eighteen months' practical experience on a station. This, it is considered, will be of great benefit to the service.

Personnel.—The total personnel of the Radiotelegraph service in the Dominion is 493.

7. FISHERIES PROTECTION SERVICE.

The Canadian Government has suitably equipped and maintains nine small cruisers, known as the Fisheries Protection vessels, for the purpose of protecting

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Canadian fisheries, and enforcing the fisheries regulations along the three-mile limit of the Canadian coasts, and at the international boundary line in the Great Lakes.

The following vessels of the Fisheries Protection service were in commission during the past year: East coast—*Canada*, *Curler*, *Constance*, *Petrel*, *Gulnare*, Great Lakes—*Vigilant*; West coast—*Malaspina*, *Galiano*, *Restless*.

C. G. S. Canada.—At the outbreak of the war, the Naval Service took over for war duties, *C. G. S. Canada*, which was commissioned under the White Ensign for naval defence work. This vessel has since been employed continuously in connection with the war, and has not been available for fisheries protection duties. In like manner the *Constance* and the *Gulnare* were employed on naval work, and were not available for fisheries protection duties.

C. G. S. Curler was utilized in the bay of Fundy, and along the west coast of Nova Scotia. The vessel was employed on minor duties up to May 4, when she proceeded to Halifax for refit. Towards the end of June, the vessel was again available for its regular duties, and proceeded to cruise along the lobster fishing grounds outside territorial waters, as far northward as the bay of Fundy.

Particularly careful watching is required in this district to see that United States smacks and otter trawlers comply with the regulations. The vessel continued on fisheries protection duties of this nature for the remainder of the season.

In addition to its regular duties, the vessel was also utilized in carrying out the inspection of life-saving stations, along the coast of Nova Scotia. It also rendered assistance on several occasions to vessels and launches disabled, and to small boats adrift. During the winter months, the ship was utilized to good advantage in keeping harbours free of ice. The commanding officer of the vessel reports that the amount of fish caught in the district which he patrolled, shows a decrease over the previous year. He attributes this to the bad weather during the season.

C. G. S. Petrel.—The *Petrel* was engaged in war work up to June 6, when she proceeded on the regular fisheries duties. The United States schooner *Lottie G. Merchant* was seized for fishing inside the three-mile limit, and handed over to the customs authorities. The *Petrel* then cruised with the United States fishing fleet, along the Nova Scotia coast as far as Louisburg. The fishing fleet then left the coast, and the *Petrel* returned to Halifax. For the remainder of the season it was utilized in fisheries protection duties and for the inspection of life-saving stations east of Halifax. On October 24, the Naval branch again took over the vessel for naval duties, upon which it remained for the rest of the year.

C. G. S. Vigilant.—The *Vigilant* was commissioned on May 8, but owing to difficulty in obtaining a crew, did not proceed on her regular duties till June 16, when she took up work along the boundary line in the Great Lakes. Cruising was carried on without incident until the end of the month. The vessel was then docked at Port Dalhousie for repairs, and did not proceed again on patrol duties until the end of July. She patrolled in lake Erie during August.

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The early part of the fishing season in the Great Lakes is reported to have been poor, but in September there was a good run of herring, and in the late fall very large quantities of fish were taken. Less poaching was noticed during the year, partly owing to the high cost of nets. During this season, the *Vigilant* steamed 4,468 miles and seized 556 nets, which were sold at auction.

On November 29, ship proceeded to Collingwood where she laid up.

C. G. S. Malaspina.—The *Malaspina* was employed on defence work, up to April 10, when she proceeded with stores for the wireless stations on the west coast. The vessel then proceeded to cruise the fishing grounds in Hecate strait, during which cruise considerable foreign fishing gear was seized. The vessel continued on fisheries work up to May 22, when she returned to Esquimalt for special duties. She was utilized for naval work, or was under repair until September 3. Throughout September the vessel was utilized to carry on inspection of the various wireless stations along the coast. For the remainder of the year, with the exception of two cruises on Fisheries Protection duty, the *Malaspina* was employed as a patrol vessel of the Royal Canadian Navy.

C. G. S. Galiano.—The *Galiano* was employed on naval work until June 12. During June and the early part of July the ship patrolled along the west coast of Vancouver island, entering many of the sounds where poaching is practised. Much illegal fishing was prevented, and a considerable amount of gear was confiscated. On July 11, the vessel was ordered to Vancouver to embark the Fisheries Commission. The members of the British Columbia Fisheries Commission were taken to various harbours, and finally disembarked on August 4.

From the 4th to 20th August, the vessel was used to deliver stores and to carry out the inspection of the wireless stations. The vessel then went into drydock for repairs, and was not available for further service until September. Throughout the remainder of the season the vessel was used to a large extent on naval work, but carried out any patrol work and inspection work, necessary.

C. G. S. Restless.—The *Restless* was employed on war work, and did not perform any Fisheries Protection duties. Although the vessels of the Fisheries Protection Service have gradually become absorbed in the work of Naval Defence, the department has been careful to have all complaints regarding the fisheries laws investigated. In this manner the fisheries laws are being generally observed through the activities of the Fisheries Protection vessels, although the vessels are also being utilized to great advantage in connection with the prosecution of the war.

8. LIFE-SAVING SERVICE.

The Life-saving service of Canada has been established for the purpose of saving the lives of those in danger at sea, and for rescuing those on board wrecked vessels along the coasts of Canada. Stations equipped with life-boats manned by trained men have been built at points along the coasts where navigation is difficult and where wrecks are most prevalent. It is not the purpose of these stations to save

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vessels or cargoes, but in many cases, after the crews have been saved, the life-boats endeavour to take off as much of the cargoes as possible.

The department also undertakes to reward bravery for life-saving at sea, but not along the coasts and in rivers. Cases of the latter should be brought to the attention of the Royal Canadian Humane Association, Hamilton, Ont.

As the fishermen along the coasts are equipping themselves with modern motor-boats or installing auxiliary power in their fishing smacks, the number of wrecks is decreasing rapidly and consequently the necessity for a large number of life-saving stations is diminishing. The fishermen are now nearly all in a position to assist each other in case of engine trouble, and the number of calls on the life-boat crews is thereby greatly reduced.

The department has, during the past year, experienced great difficulty in obtaining suitable crews to man the life-boats, owing to the many calls for men. The question of closing down a number of stations which are of least use is being seriously considered.

During the fiscal year 1917-18, thirty-seven stations were in operation, of which twenty-four are located on the East coast, three in British Columbia, and ten along the Great Lakes. Six of these stations have permanent crews on duty throughout the year, five have permanent crews during the navigation season, and the remainder have volunteer crews, who drill twice a month, and who are called out in case of a wreck.

On the East coast assistance was rendered to disabled vessels or motor-boats by the crews of the stations at Duncan Cove, Herring Cove, Scattari, Cape Tormentine, Escuminac, Little Wood island, and Charlottetown.

On the Great Lakes the crews from Long Point, Southampton, and Toronto were called out. As in previous years the Toronto crew were called upon to render assistance in a great number of cases of small pleasure boats, they having been called out on forty-four different occasions. The Toronto life-saving station is equipped with a pulmotor, and rendered assistance in many cases of drowning.

In British Columbia the Bamfield station was the only one called upon to render assistance. The life-saving crew rescued from the burning gasoline launch *Maria*, three cable operators shortly before the vessel sank.

9. FINANCIAL STATEMENT, FISCAL YEAR 1917-18.

The attached financial statement shows the expenditure under the various appropriations and revenue received by the department during the fiscal year ended March 31, 1918.

The expenditure on account of H. M. C. S. *Niobe*, *Rainbow*, the submarines and other vessels engaged in the defence of our coasts, the Royal Canadian Naval Hospital (Halifax), and extraordinary expenditure for the dockyards at Halifax and Esquimalt have been charged to war appropriation. The ordinary expenditure for the upkeep and maintenance of the Royal Naval College, Halifax and Esquimalt dockyards, has been charged to naval service appropriation.

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A statement of stores supplied, work done, and advances made on behalf of the British, French, Italian and American Governments, and others, is also given. These disbursements amount during the fiscal year 1917-18 to \$22,128,747.96, and to this should be added the sum of \$157,391.83 transferred from fiscal year 1916-17, thus making a grand total of \$22,286,139.79 debited against the Allies, etc., during fiscal year 1917-18. Credits and cash received during the year amount to \$20,637,105.86, leaving an outstanding balance of \$1,649,033.93, which is not included in the amounts charged to war or naval appropriations but carried forward in suspense to the fiscal year 1918-19.

STATEMENT of jobs completed in the workshops, and stores supplied by the Halifax and Esquimalt dockyards during fiscal year 1917-18.

	Halifax.	Esquimalt.
	\$ cts.	\$ cts.
Naval Service	1,222,319.41	305,762.74
Fisheries Protection service	19,817.30	27,047.91
Hydrographic Surveys	230.14	9,014.88
Life Saving service	1,307.72	2,421.06
Radiotelegraph Service	7,025.82	3,898.19
Fishery Patrol service	8,530.83	6,220.67
British Admiralty	938,220.79	478,283.72
French Admiralty	10,820.37	
Italian Government	8,955.90	
U.S. Government	19,345.93	
Dept. of Marine		1,099.18
Dept. of Militia and Defence		1,222.62
Sundries	540.35	8,390.40
	(A) 2,237,114.56	843,361.37
Wages paid (B)	304,910.76	313,104.39
Salaries	51,914.75	39,785.13
Stores issued (C)	1,927,071.75	516,200.22

(B) and (C) included in (A).

STATEMENT of appropriation accounts for fiscal year 1917-18.

Service.	Appropriation.	Expenditure.	Balance Unexpended.
	\$ cts.	\$ cts.	\$ cts.
Naval Service.....	1,000,000 00	398,919 93	601,080 07
Fisheries Protection service.....	375,000 00	155,122 50	219,877 50
Hydrographic Surveys.....	200,000 00	148,180 78	141,819 22
Radiotelegraph service.....	295,000 00	224,387 35	70,612 65
Tidal service.....	35,000 00	22,193 76	12,806 24
Patrol of the northern waters of Canada.....	50,000 00	25,863 67	24,136 33
New Fisheries Protection steamers.....	100,000 00	100,000 00
Rewards for saving life, including Life Saving service.....	125,400 00	94,904 71	30,495 29
	2,270,400 00	1,069,572 70	1,200,827 30
Fisheries—			
Salaries and disbursements of Fishery officers.. . . .	305,000 00	267,210 21	37,789 79
Building fishways and clearing rivers.....	30,000 00	8,975 39	21,024 61
Legal and incidental expenses.....	4,000 00	2,452 24	1,547 76
Canadian Fisheries Museum.....	8,000 00	1,833 65	3 166 35
Oyster culture.....	6,000 00	5,003 18	996 82
Cold storage and transportation of fish.... .	125,000 00	116,578 91	8,421 09
Dogfish reduction works.....	60,000 00	38,036 74	21,963 26
Service of Customs officers <i>re Modus Vivendi</i> licenses..	900 00	289 65	610 35
Fisheries Intelligence bureau.....	5,000 00	2,873 45	2,126 55
Fisheries Patrol service.....	190,000 00	187,839 47	2,160 53
Fisheries exhibit (Toronto Exposition).....	10,000 00	9,854 72	145 28
Fish breeding establishments.....	100,000 00	270,796 95	129,203 05
Inspection of canned and pickled fish.....	25,000 00	10,639 76	14,360 24
Marine Biological stations and investigations.....	26,000 00	26,000 00
	1,194,900 00	951,384 32	243,515 68
Civil Government.....	188,950 00	162,504 61	26,445 39
Contingencies....	50,000 00	49,456 93	543 07
	238,950 00	211,961 54	26,988 46
Fishing Bounty.. . . .	160,000 00	159,893 10	106 90
Recapitulation.			
Naval Service.....	2,270,400 00	1,069,572 70	1,200,827 30
Fisheries.....	1,194,900 00	951,384 32	243,515 68
Civil Government.....	188,950 00	162,504 61	26,445 39
Contingencies.....	50,000 00	49,456 93	543 07
Fishing Bounty...	160,000 00	159,893 10	106 90
	3,864,250 00	2,392,811 66	1,471,438 34
War appropriation—			
Disbursements.....	\$ 22,071,121 33		
Carried from 1916-17.....	157,391 83		
Gross expenditure.....	\$ 20,228,513 16		
Less—			
Reimbursements and credits.....	\$ 9,577,268 93		
Transferred to 1918-19.....	995,015 09		
	\$ 10,572,284 02		
Net expenditure.....		9,666,229 14	
Imperial Government special account—			
Disbursements.....	\$ 12,740,000 00		
Reimbursements.....	\$ 12,085,981 16		
Transferred to 1918-19.....	654,018 84		
	12,740,000 00		
Total net expenditure fiscal year 1917-18		12,059,040 80	

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STATEMENT showing accounts outstanding in respect to stores supplied work done and advances made, etc., at the end of fiscal year 1917-18.

Supense accounts.

	Debits.	Credits.	Balance Transferred to 1918-19.
	\$ cts.	\$ cts.	\$ cts.
British Admiralty.. .. .	8,843,544 63	8,032,476 43	811,068 20
Imperial Government.....	12,740,000 00	12,085,981 16	654,018 84
French Admiralty.....	76,666 96	66,301 87	10,365 09
Italian Government.....	22,844 52	22,476 88	367 64
Russian Government	6,842 65		6,842 65
United States Government.....	54,668 15	7,093 39	47,574 76
Department of Militia and Defence.....	117,580 34	113,243 41	4,336 93
Department of Railways and Canals	5,651 81	5,634 64	17 17
Miscellaneous.....	326,293 01	303,898 08	22,394 93
Allotments (balance).....	56,182 42		56,182 42
Sundry advances (balance).....	35,865 30		35,865 30
Totals.....	22,286,139 79	20,637,105 86	1,649,033 93

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STATEMENT OF REVENUE of the Department of the Naval Service for fiscal year ended March 31, 1918.

	\$ cts.	\$ cts.
Royal Naval College—College fees (37 cadets).....		3,700 00
Fisheries revenue.....		114,572 39
Modus Vivendi (licenses to United States fishing vessels) ..		4,179 00
Casual revenue.....		13,545 38
Miscellaneous revenue.....		3,293 40
Wireless Apparatus licenses.....		197 75
Wireless Operators' examination fees.....		182 00
Fish Culture revenue.....		5,341 60
Fines and forfeitures.....		600 00
Radio-telegraph revenue—		
Alert Bay station.....	720 02	
Cape Lazo station.....	468 98	
Dead Tree point station. ..	1,063 38	
Digby island station.....	3,134 70	
Estevan point ..	3,191 47	
Gonzales hill ..	3,603 32	
Ikroka land ..	412 43	
Pachena point ..	97 63	
Point Grey ..	3,821 30	
Triangle ..	1,819 95	
Campdown ..	216 93	
North Sydney ..	353 52	
Sable island ..	47 90	
Heath point ..	3 10	
Magdalen islands station.....	363 55	
H M.C.S. "Margaret" station.....	9 12	
Port Barwell station ..	11 33	
Sault Ste Marie ..	34 93	
Port Arthur station ..	13 81	
Point Edward station.....	21 05	
Midland station ..	9 87	
Toronto ..	8 15	
Tobermory ..	2 27	
Kingston ..	1 79	22,430 50
		168,015 02

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FISHERIES REVENUE for fiscal year ended March 31, 1918.

Provinces.	Amount collected.	Refunds.	Net amount
	\$ cts.	\$ cts.	\$ cts.
Ontario.....	2,345 48		2,345 48
Quebec.....	7,664 73		7,664 73
New Brunswick	14,439 53	10 00	14,429 53
Nova Scotia	6,663 94		6,663 94
Prince Edward island.....	3,260 26	4 00	3,256 26
Manitoba.....	12,910 65		12,910 65
Saskatchewan.....	3,643 65		3,643 65
Alberta.....	9,777 94	10 00	9,767 94
British Columbia.....	53,665 21	150 00	53,515 21
Yukon	375 00		375 00
	114,746 39	174 00	114,572 39
Modus Vivendi licenses.....	4,387 50	208 50	4,179 00
			118,751 39

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STATEMENT of expenditure under the war

Ship or Establishment.	Pay and allowances.	Stores and allowances.	Medical services.	Subsistence of prisoners.	Boys, training and recruiting.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
H.M.C.S. "Niobe"	193,961 59	558,312 74	7,356 39	953 78	1,028 50
H.M.C.S. "Rainbow"	221,050 44	145,432 37	6,291 80	311 28	731 62
Submarines and depot.....	93,372 66	83,867 85	498 47	15 00	380 71
H.M.C.S. "Shearwater" (Shore depot).	28,469 91	39,852 40	1,539 17	45 72	2,614 60
Port of Vessel No. 6.....					
6 Small Trawlers (P.L.S. No. 1 to 6)					
Wireless stations.....					
Halifax dockyard.....		762,165 56			
Esplanade dockyard.....		143,589 77			
R.N.C.V.R. (Overseas division).....	328,902 18	39,913 46	36 06		22,408 75
Hopper barges Nos. 1 & 2.....	12,798 38	33,066 44	26 00		
R.C.N. Hospital, Halifax.....	2,632 85	16,479 74	481 33		
Port defences.....	44,005 02	38,900 20	385 20		
Atlantic defences.....	861,187 02	961,685 05	3,864 12	527 10	6 00
Hospital stores.....	115,395 08	11,276 68	440 50		
General Account.....		172,554 15	70 00		35,573 69
	2,203,775 13	3,007,096 41	21,029 04	1,852 88	62,743 87

Less credits.....		
Halifax dockyard, water delivered to sundry vessels		6,370 76
Hopper barge No. 1 " " " "		15,468 47
Hopper barge No. 2 " " " "		21,617 76
H.M.C.S. "Niobe" gun mountings.....		6,586 67
War donations (Thos. Robb).....		5,250 00
Net expenditure		9,666,229 14

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appropriation for fiscal year 1917-18.

Repairs and mainten- ance.	Purchase of ships and alterations.	New ships.	Works, lands, buildings.	Miscel- laneous effective services.	Non-effec- tive pay and separation allowances.	Charter of vessels.	Total.
\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
8,685 18				85,873 48	3,590 16		1,159,801 82
19,135 92				15,890 76	953 78		411,777 97
47,889 31				4,471 41	942 98		231,438 39
				1,926 71	336 69		74,785 20
	101,234 10						101,234 10
	101,409 11						101,409 11
		855,886 85					855,886 85
		1,206,460 42					1,206,460 42
			70,521 71				70,521 71
108,661 49			17,397 32	1,379 72			889,604 09
							143,589 77
				20,007 84	77,888 61		489,156 90
16,145 57				621 39			62,657 78
30,340 15			29,910 93	1,810 29			81,655 29
27,263 00				10,525 18		1,892 00	122,970 60
429,473 36	137,136 68			217,102 37	180 06	268,066 76	2,879,228 52
				25 647 02	369 86		153,129 14
				123,900 46	35,416 84		686,215 14
687,593 98	339,779 89	2,062,347 27	117,829 96	509,156 63	438,358 98	269,958 76	9,721,522 80

Statement of expenditure under the naval appropriation for the fiscal year ended March 31, 1918.

	Royal Naval college.	Habfax dockyard.	Esquimalt dockyard.	H. M. C. S. "Niobe."	Headquarters	General account.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Pay and allowances.	49,423 79		129 60		18,648 95		68,202 34
Stores and allowances.	19,646 34	90,052 98	56,723 65		1,273 70	10,841 36	178,138 03
Medical services.	720 14	2 00					722 14
Cadet's miscellaneous expenses.	954 67						954 67
Repairs and maintenance.	17,495 85	137,767 73	113,356 53				268,620 11
Works, lands and buildings.	2,689 17	16,771 94	332 92				19,794 03
Miscellaneous effective services.	16,268 92	3,212 11	3,294 72		2,018 30	557 63	25,351 77
Non-effective pay.	384 95			350 15			735 10
Depreciation.		14,158 12	2,123 19				16,281 31
	107,483 83	261,964 88	175,960 61	350 15	21,941 04	11,398 99	579,099 50
Less credits—							
Percentage on stores.		65,501 60	40,142 33				105,643 93
labour.		12,838 98	55,527 32				68,366 30
Arising.		1,375 42	4,793 92				6,169 34
	107,483 83	182,248 88	75,497 04	350 15	21,941 04	11,398 99	398,919 93

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GENERAL.

Each branch of the Naval Service has been operated throughout the year in an efficient manner. Those branches directly dealing with matters pertaining to the war have increased to very large proportions. The different staffs have spared no effort in coping with the increased amount of work, and the department has been able to meet all requirements in this regard.

I have the honour to be, sir,

Your obedient servant,

G. J. DESBARATS,

Deputy Minister of the Naval Service of Canada.

1913

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1897-1898

ANNUAL REPORT
OF THE
FISHERIES BRANCH

Presented to the House of Commons

by the

1897

Department of the Interior

OTTAWA

1898

